UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,133	01/30/2002	Yu-Cheun Jou	PA450C1	3837

23696 7590 10/17/2005

QUALCOMM, INC
5775 MOREHOUSE DR.
SAN DIEGO, CA 92121

EXAMINER	
MEW, KEVIN D	

ART UNIT	PAPER NUMBER
2664	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/062,133	JOU, YU-CHEUN	
	Examiner	Art Unit	
	Kevin Mew	2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *1/30/2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/30/2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 1-2, 4-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US Publication 2001/0009545) in view of Li (USP 6,141,353).

Regarding claim 1, Schilling discloses a wireless transmitter (packet transmitter, paragraph 0032, and the combined system of elements 41, 42, 44, 51, 39, 58, 45, 46, 50, Fig. 2), comprising:

an encoder (element 42, Fig. 2) for encoding a set of information bits to provide a set of code symbols (encodes the data from the transmitter-FIFO memory as encoded or scrambled data, paragraph 0035);

a demultiplexer (a demultiplexing means, paragraph 0036 and Fig. 2) for providing said set of code symbols in first and second code symbol subsets having code symbol rates (demultiplexes the encoded data into a plurality of sub-data-sequence signals, with a respective sub-data sequence signal at a respective output of the demultiplexer means, paragraph 0027) to first and second modulators (products device 51 and chip-sequence generator, and product device 58 and chip-sequence generator, Fig. 2), said first and second modulators respectively modulating said first and second code symbol subsets according to first and second code symbol rate formats (product devices 51 and 58 multiplies a respective sub-data-sequence signal

by a respective chip-sequence signal, paragraphs 0044, 0045), respectively, to provide modulated first code symbol subset and second code symbol subset (to generate a plurality of spread-spectrum channels, respectively, paragraph 0045).

a transmission subsystem (a transmitter subsystem, element 50, paragraph 0038 and Fig. 2) for said modulated first code symbol subset on a first carrier frequency and said modulated second code symbol subset on a second carrier frequency (includes an oscillator and a multiplier for shifting a signal to a carrier frequency, paragraph 0038).

Schilling does not disclose said different code symbol rates have a ratio equal a number other than one.

However, Li discloses that the teaching of encoding speech frames into subsequent traffic channel frames of data at variable data rates (col. 9, lines 46-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitting method and apparatus of Schilling with the teaching of Li such that data are encoded at the encoder at variable data rate so that the different code symbol rates have a ratio equal a number other than one. The motivation to do so is to allow data to be encoded at variable data rates to reduce the data transmission rate during times of reduced speech activity which therefore results both in a reduction of interference with other users as well as in a reduction in average transmit power of the mobile station.

Regarding claim 2, the combined system of Schilling and Li discloses all the aspects of the claimed invention set forth in the rejection of claim 1 above. Schilling does not explicitly disclose the wireless transmitter of claim 1 wherein said first and second modulators repeat code

symbols within said first and second code symbol subsets, respectively, according to a said respective code symbol rate. However, Li discloses a function for repeating symbols for half, quarter, and eighth rates (col. 12, lines 45-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitting method and apparatus of Schilling with the teaching of Li such that symbols are repeated according to a respective code symbol rate. The motivation to do so is to allow data to be encoded at variable data rates to reduce the data transmission rate during times of reduced speech activity which therefore results both in a reduction of interference with other users as well as in a reduction in average transmit power of the mobile station.

Regarding claim 4, Schilling further discloses the wireless transmitter of claim 1 wherein said first modulator (a first product device and a first chip-sequence means) includes a first interleaver (a first chip-sequence generator) having a first interleaver format (having a first chip-sequence signal generated) dependent on a first code symbol rate (in response to a particular output of the demultiplexer, paragraph 0037), and said second modulator (a second product device and a second chip-sequence means) includes a second interleaver (a second chip-sequence generator) having a second interleaver format dependent on a second code symbol rate (in response to a particular output of the demultiplexer, paragraph 0037).

Regarding claim 5, Schilling also the wireless transmitter of claim 1 wherein said first modulator includes a first PN scrambler for scrambling said first code symbol subset according to a first code symbol rate (a first PN-sequence bit or chip-sequence bit for scrambling a first a

respective sub-data-sequence signal, paragraphs 0067, 0037), and said second modulator includes a second PN scrambler for scrambling said second code symbol subset according to a second code symbol rate (a second PN-sequence bit or chip-sequence bit for scrambling a second a respective sub-data-sequence signal, paragraph 0067, 0037).

Regarding claim 6, Schilling also the wireless transmitter of claim wherein said transmission subsystem includes a switch for selectively switching (an oscillator and a multiplier) said first and second modulated code symbol subsets respectively onto a third carrier frequency (includes an oscillator and a multiplier for shifting a signal to a carrier frequency, paragraph 0038).

2. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US Publication 2001/0009545) in view of Li (USP 6,141,353), and in further view of Kotzin (USP 5,734,967).

Regarding claim 3, the combined system of Schilling and Li discloses all the aspects of the claimed invention set forth in the rejection of claim 2 above, except fails to explicitly show the wireless transmitter of claim 2 wherein said transmission subsystem scales a respective energy of said first and second modulated code symbol subsets according to a respective amount of code symbol repetition. However, Kotzin discloses channel symbol repetition allows maintenance of the energy per symbol to noise power spectral density ratio (col. 1, lines 53-67 and col. 2, lines 1-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitting method and apparatus of Schilling and Li with the teaching of Kotzin such that it will scale a respective energy of said first and second modulated code symbol subsets according to a respective amount of code symbol repetition. The motivation to do so is to reduce the mean transmit power so that the system forward and reverse link capacity will be increased.

3. **Claims 7-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling (US Publication 2001/0009545) in view of Li (USP 6,141,353), and in further view of Trans (US Publication 2001/0038674).

Regarding claims 7 and 12, Schilling discloses a circuit to perform a method for modulating an information signal (the combined system of elements 41, 42, 44, 51, 39, 58, 45, 46, 50, Fig. 2), said circuit comprising:

an encoder of said information signal according to a format to produce encoded symbols (encodes the data from the transmitter-FIFO memory as encoded or scrambled data, paragraph 0035); and

a demultiplexer (a demultiplexer means, paragraph 0036 and Fig. 2) for providing said encoded symbols to a plurality of modulators (demultiplexes the encoded data into a plurality of sub-data-sequence signals, with a respective sub-data sequence signal at a respective output of the demultiplexer means, paragraph 0027) to first and second modulators (products device 51 and chip-sequence generator, and product device 58 and chip-sequence generator, Fig. 2),.

Schilling does not explicitly show the demultiplexer is a variable ratio demultiplexer where a ratio of said different symbol rates equals a number other than one, wherein said ratio is selected in response to a control signal from a control processor.

However, Li discloses that the teaching of a function for encoding speech frames into subsequent traffic channel frames of data at variable data rates by receiving a add next rate signal (col. 9, lines 46-67 and Figs. 3 and 5).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitting method and apparatus of Schilling with the

teaching of Li such that data are encoded at the encoder at variable data rate so that the different code symbol rates have a ratio equal a number other than one. The motivation to do so is to allow data to be encoded at variable data rates to reduce the data transmission rate during times of reduced speech activity which therefore results both in a reduction of interference with other users as well as in a reduction in average transmit power of the mobile station.

Schilling does not explicitly show the encoding performed is error-correction encoding. However, Trans anticipates the use of error-correction encoding (paragraph 0414).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combined system of Schilling and Li with the teaching of Trans such that error-correction encoding will be employed during the encoding process. The motivation to do so is to enhance signal-to-noise ratio margin and to improve bit error rate BER performance of the system.

Regarding claim 8, Schilling also discloses the circuit of claim 7 wherein at least two of said plurality of modulators (products device 51 and chip-sequence generator, and product device 58 and chip-sequence generator, Fig. 2) modulate said encoded symbols according to a different modulation format determined by said control processor in response to a symbol rate of said encoded symbols (product devices 51 and 58 multiplies a respective sub-data-sequence signal by a respective chip-sequence signal with a variable data rate, paragraphs 0044, 0045).

Regarding claim 9, the combined system of Schilling, Li, and Trans discloses all the aspects of the claimed invention set forth in the rejection of claim 8 above. Schilling does not

explicitly show the circuit of claim 8 wherein each of said modulators further comprises a symbol repeater for repeating said encoded symbols according to said symbol rate. However, Li discloses a function for repeating symbols for half, quarter, and eighth rates (col. 12, lines 45-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitting method and apparatus of Schilling with the teaching of Li such that symbols are repeated according to a respective code symbol rate. The motivation to do so is to allow data to be encoded at variable data rates to reduce the data transmission rate during times of reduced speech activity which therefore results both in a reduction of interference with other users as well as in a reduction in average transmit power of the mobile station.

Regarding claim 10, Schilling also discloses the circuit of claim 9 wherein each of said modulators further comprises an interleaver for interleaving said encoded symbols according to an interleaver format determined by said control processor (a first product device 51 and a first chip-sequence means for interleaving the encoded symbols with a first chip-sequence signal and a second product device 58 and a second chip-sequence means for interleaving the encoded symbols with a second chip-sequence signal, paragraph 0037).

Regarding claim 11, Schilling also discloses the circuit of claim 10 wherein each of said modulators further comprises a PN scrambler for changing the sign of said encoded symbols according to a PN sequence determined by said control processor in response to said

symbol rate (each PN sequence signal that applies to the encoded signal is orthogonal to each other and hence the sign of the encoded signal is changed, paragraph 0024).

Regarding claim 13, the combined system of Schilling, Li, and Trans discloses all the aspects of the claimed invention set forth in the rejection of claim 12 above. Schilling does not explicitly disclose the method of claim 12 wherein said step of modulating further comprises the step of repeating said encoded symbols according to said symbol rate. However, Li discloses a function for repeating symbols for half, quarter, and eighth rates (col. 12, lines 45-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the transmitting method and apparatus of Schilling with the teaching of Li such that symbols are repeated according to a respective code symbol rate. The motivation to do so is to allow data to be encoded at variable data rates to reduce the data transmission rate during times of reduced speech activity which therefore results both in a reduction of interference with other users as well as in a reduction in average transmit power of the mobile station.

Regarding claim 14, Schilling also discloses the method of claim 13 wherein said step of modulating further comprises the step of interleaving said encoded symbols according to a different interleaver format (a first product device 51 and a first chip-sequence means for interleaving the encoded symbols with a first chip-sequence signal and a second product device 58 and a second chip-sequence means for interleaving the encoded symbols with a second chip-sequence signal, paragraph 0037).

Regarding claim 15, Schilling also discloses the method of claim 14 wherein said step of modulating further comprises changing the sign of said encoded symbols according to a PN sequence and in response to said symbol rate (each PN sequence signal that applies to the encoded signal is orthogonal to each other and hence the sign of the encoded signal is changed, paragraph 0024).

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 5,761,634 to Stewart et al.

US Publication 2004/0223536 to Schilling

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WELLINGTON CHIN
SUPERVISORY PATENT EXAMINER

KDM
Art Unit 2664